

OPTICAL PHENOMENA.

Solar Halos.—But few were reported in comparison with previous months. None with any remarkable phenomena attending were reported.

Lunar Halos.—But few lunar halos were reported, the largest number, 6, from Dubuque, Iowa. That of the 24th was observed at several stations in Iowa and Illinois, but no particular phenomena in connection therewith was reported.

MISCELLANEOUS PHENOMENA.

Lightning at Visalia, Cal., 18th.

Sand-storms at Coleman, Texas, 4th and Visalia, Cal., 26th.

Grasshoppers.—Air full of them, moving south on 31st at Holton, Kansas. Shasta valley overrun with them early in month; they devoured everything green, and crops suffered much from them. Martis valley, Truckee river, vegetation completely destroyed by them, requiring cattle range to be abandoned for the season.

Mirage.—Henrietta, Texas, 3rd; Olivet, Dak., 7th, 24th and 31st; Breckenridge, Minn., 9th, 22nd; Pembina, Dak., 29th.

Prairie Fires.—Ft. Gibson, Ind. Ty., 2nd, 14th; Burlington, Vt., 2nd, 5th to 10th, 12th to 14th; Boise City, Idaho, 4th to 9th, 13th to 17th; Near Salt Lake City, 8th to 20th, 27th; Creswell, Kan., 8th, 9th, 23rd, 31st; Port Huron, 27th; 1st, southeast of San Jose, Cal.; 1st to 7th, Yuba river valley, Cal.; 3rd, Stanislaus co., Cal.; 4th, Santa Clara, co., Cal.; 6th to 20th, near Verdi, Nev., doing much damage; 11th to 23rd, Calaveras Co., Cal., "hundreds of acres of thrifty young timber destroyed."

Sunsets.—The characteristics of the sky at sunset, as indicative of fair or foul weather, for the succeeding, twenty-four hours, have been observed at all Signal Corps stations. Reports from 129 stations show 4,892 observations to have been made, of which 34 were reported doubtful; of the remainder 4,858 or 66.6 per cent were followed by the expected weather.

Meteors.—Meteors were reported in considerable numbers, being most general from the 9th to the 11th and from 19th to 22d. The largest numbers were reported from Indiana, Maryland, New Jersey and New York. None were reported west of the 100th meridian, except at Georgetown, and San Juan Valley, Col., on the 5th 10th, (on which date they were very numerous in Indiana and Colorado), and 23d, and at Tucson, Ariz., on the 9th.

Earthquakes.—On the 10th, 1:15 p. m., very slight at Los Angeles, California. The motion was more perceptible at Santa Monica, about 13 miles distant, and a tidal wave which followed was attributed to it. At San Fernando the shock was quite severely felt. At 12:30 p. m. of the 21st, at Buffalo, New York, a light shock followed by others, from 1:20 to 1:32 p. m., attended in latter case by a rumbling sound. August 21st, in Ontario, at Niagara, St. Catharines, Thorald, Welland, Allanburg, Port Dalhousie and Beausville. It was the most violent at St. Catharines at 2:55 a. m., duration estimated from two to ten seconds; movement was from east to west. At Lockport, N. Y., a shock was felt at 4:30 p. m. (lasting five seconds) with very loud report.

Sun Spots.—The following record of observations, made by D. P. Todd, Assistant, has been forwarded by Prof. S. Newcomb, U. S. Navy, Superintendent Nautical Almanac, Washington, D. C.:

DATE— AUGUST, 1879.	No. of new—		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		REMARKS.
	Groups	Spots.	Groups	Spots.	Groups	Spots.	Groups	Spots.	
10th, 2 p. m...	1	4	0	0	0	0	1	4	Faculae.
10th, 3 p. m...	0	0	0	0	0	0	1	4	
12th, 4 p. m...	1	10	0	0	0	0	2	14	
12th, 5 p. m...	0	0	0	0	0	0	2	14	
14th, 5 p. m...	0	0	1	12	0	0	1	2	Faculae.
16th, 3 p. m...	0	0	1	2	0	0	0	0	
20th, 4 p. m...	1	1	0	0	0	0	1	1	
21st, 5 p. m...	0	0	1	1	0	0	0	0	
24th, 5 p. m...	1	12	0	0	0	0	1	12	Faculae.
27th, 3 p. m...	1	8	0	4	1	8	2	11	
28th, 3 p. m...	0	0	0	1	0	0	2	10	
30th, 6 p. m...	0	0	1	2	0	0	1	3	
31st, 2 p. m...	0	0	0	0	0	0	1	3	The eight spots of the group which re-appeared on the 27th, have coalesced into three spots, one of them quite large.

Faculae were also observed on the 2nd at 2 p. m. and on the 3rd at 3 p. m.; observations were made but no spots observed on the 1st at 2 and 5 p. m., 5th and 6th 3 p. m., 8th at 2 p. m., 18th at 6 p. m. and on the 19th at 4 p. m. Mr. David Trowbridge at Waterburgh, N. Y., reported 1st to 9th, 11th to 13th, 19th to 23rd and 27th, no spots perceptible; 10th, 7:30 a. m. small spot about one-fifth diameter from west margin of disc not visible on the 9th at 3:30 p. m. or on the 11th at 6:30 p. m.; 24th, a group of 2 or more small spots a little east of the center of disc; 28th, a group of 2, one well defined, near eastern margin; 30th, 2 spots; 31st, one spot which was still visible on Sept. 1st. Mr. Wm. Dawson at Spiceland, Ind., reported 1st, 2nd, 4th, 7th to 9th and 17th to 21st, no spots; 10th, 8 spots in one group, one spot about half-way from center to western edge; 11th, 15 spots in two groups—new group of 5 little spots in NW.

quadrant; 12th, 29 spots in two groups, the northern group having 23 spots, 5 prominent, increased wonderfully in past 24 hours; 13th, 14 spots in two groups; 14th, 9 spots in 2 groups very near western edge; faculae in both; 22nd, 3 small spots in one group about one-sixth of sun's diameter east of center; 25th, about 15 spots in one group between center and west edge; 26th, 13 spots in 2 groups, new group of 5 spots at east edge; 27th, 21 spots in three groups; western group has 3 spots, one large; eastern group has 15 spots, finely prominent and filled with faculae; third group, near southeast margin, has 3 little spots; 28th, 22 spots in 2 groups, 20 spots, one large, in eastern group, southeast group disappeared; 29th, 26 spots in 2 groups, eastern group 18 spots; one group of eight small spots away south; 30th, 16 spots in eastern group, southern group disappeared; 31st, 19 spots in 2 groups; two little spots in faculae near east edge. Mr. J. Harcourt, at Wappinger's Falls, N. Y., reports:—10th, one group of 6 spots; 31st, at 8 a. m. and 2 p. m. one large spot and a small group. Mr. F. Hess, at various points in the San Juan Valley, Colorado, 10th, and 11th, one large and three small spots; 24th, 6 a. m., group of 9 spots near sun's center; 27th, 5 p. m. one large and one small spot near northeast limit; 28th, one large and two small spots near southeast limit; 29th, to September 6th, one large and one small spot; sun examined but no spots seen on the 25th. Observations were made throughout the month at Fort Whipple, Va., but no spots seen.

NOTES AND EXTRACTS.

[From *Nature*, August 14th, 1879.]

The statistical review of volcanic phenomena during 1878, which Prof. Fuchs has recently published, and which forms the continuation of many previous statistical accounts of the same nature, shows the unusually large number of *twelve* eruptions in the course of the year. Most of them occurred in remote localities and gave evidence of the activity of volcanos which were generally but little known and which are all difficult of access." The following eruptions are mentioned in *Nature's* article: Mt. Vesuvius became active April 20th. A small flow of lava took place at the end of September and from November 1st to 9th.

Active and hitherto unknown volcanos were seen at the southern point of South America from January 10th to 18th. A great eruption occurred in Tanna Island, New Hebrides, on January 10th, lasting a short time and accompanied by a mighty tidal wave which inundated a great part of the Island. A second outbreak followed February 4th. Early in February an eruption happened in the island of Birara, group of New Britain. "The third eruption of February took place from the volcano Isluga in South America, * * accompanied by a fearful earthquake, and so great were the masses of lava ejected, that villages, * * more than five leagues distant from the volcano, were completely destroyed by the incandescent streams. Smaller eruptions occurred from Mt. Hecla during March; from Asamayama, Japan, and Cotopaxi in October; from Tapaco, the Situa and the Isalco in San Salvador." Important eruptions took place in the volcanic series of the Aleutian Islands. Raitea and Borabora, Society Islands are reported completely devastated by volcanic action. The well known mud volcano near Paterno, Sicily, was in eruption from December 10th to 31st, remaining active at the end of the year.

"The number of earthquakes reported during 1878, amounts to 103," in which only complete earthquake periods are counted. The most violent and destructive took place January 23rd, in Peru and Bolivia. That of October 2nd, in southern part of San Salvador, was also very violent."

European Earthquakes.—January 28th, North-western France and Southern England, January 16th, North-western Switzerland with repeated shocks. Other repeated earthquakes at Innsbruck January 3rd, 10th, 11th, February 2nd, August 9th; Gross Gerau, January 2nd and March 25th; Lisbon, January 26th, 27th and June 8th; Premont repeated shocks, November 25th; Constantinople, Ismid and Brussa, from 19th to end of May. The Low Rhenish earthquake August 28th affected over 2,000 geographical square miles including Arnsbergh and Hanover in the north, Michelstadt and Odenwald to the south-east, Strassburg and Paris in the south, Brussels in the west and Utrecht in the north-west. "It is remarkable that the phenomenon was only noticed at the surface, * * not one of the eleven hundred miners working at a depth of three hundred metres at Altessen noticed the least shock."

[From *Nature* August 7th, 1879.]

"Geneva Society of Physics and Natural History, March 6th. M. Ph. Plantamour observed during the cyclone of February 20th, a notable depression of level of the lake of Geneva. The wind produced this effect of depression notwithstanding the diminution of atmospheric pressure indicated by the barometer, and which would tend to raise the level of the water."

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